

Appln. No. 10/722,943  
Amendment dated March 17, 2005  
Reply to Office Action of January 14, 2005

#### REMARKS/ARGUMENTS

Reconsideration of the present application, as amended, is respectfully requested.

The January 14, 2005 Office Action and the Examiner's comments have been carefully considered. In response, claims are cancelled and amended, and remarks are set forth below in a sincere effort to place the present application in form for allowance. The amendments are supported by the application as originally filed. Therefore, no new matter is added.

#### ELECTION/RESTRICTIONS

The Examiner's indication that claim 1 is withdrawn from further consideration as being drawn to a non-elected species, there being no allowable generic or linking claim, is acknowledged. In response, claim 1 is cancelled.

#### ALLOWABLE SUBJECT MATTER

The Examiner's indication that claims 3-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims is acknowledged and appreciated. In response, claims 4 and 11 are

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rewritten in independent form to include limitations from claim 2.

#### PRIOR ART REJECTION

In the Office Action claim 2 is rejected under 35 USC 102(b) as being anticipated by USP 4,655,312 (Frantom et al.).

The present claimed invention as defined by claim 2 is directed to an automotive passenger restraint and protection apparatus for an automotive vehicle, having a seat belt, for restraining an occupant of the automotive vehicle by the seatbelt to protect the occupant. The apparatus includes a motor for retracting and protracting the seatbelt, seatbelt attaching state detecting means for detecting whether the seatbelt is in a state attached to the occupant or in a state disconnected from the occupant, danger degree detecting means for detecting a significant degree of danger of collision of the automotive vehicle, and control means for controlling the motor so as to retract the seatbelt to a limit thereof and then protract the seatbelt to thereby give a predetermined amount of looseness to the seatbelt. The control means controls the motor so as to give a first predetermined amount of looseness to the seatbelt when the significant degree of danger is not detected by the danger degree detecting means while the seatbelt is detected to be in

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the state attached to the occupant, and controls the motor so as to provide a second predetermined amount of looseness to the seatbelt which is smaller than the first predetermined amount of looseness when the significant degree of danger is detected by the danger degree detecting means while the seatbelt is detected to be in the state attached to the occupant. The danger degree detecting means includes at least one of vehicle speed detecting means for detecting traveling speed of the automotive vehicle, braking detecting means for detecting stepping-on of a brake pedal of the automotive vehicle, steering angle change rate detecting means for detecting a rate of change in a steering angle of the automotive vehicle, and illuminance detecting means for detecting ambient illuminance of the automotive vehicle, and raindrop detecting means for detecting raindrops on the automotive vehicle.

Frantom et al. (U.S. Patent No. 4,655,312) disclose a safety restraint system having a seat belt retractor driven by an electric motor for adjusting the seat belt about the operator (col. 1, lines 7 - 10). The safety restraint system of Frantom et al. includes a seat belt 10, a seat belt retractor 14, a Logic Control 28, a Motor Power Control circuit 30, a crash sensor 32, and a motor 42 (col. 3, line 66 to col. 4, line 12, and FIGS 1 and 2).

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The Logic Control 28 is responsive to the crash sensor 32 to activate the Motor Power Control 30 to energize the motor driven retractor 14, to take-up the slack in the seat belt 10 before crash loads are applied to the seat belt by the occupant. The crash sensor may be an inertia activated switch or a simple radar system which anticipates a crash from distance and/or rate of closure signals. Even with an inertia switch it is possible to take up the seat belt's slack because there is a 15 to 20 millisecond delay between the detection of the crash condition by the inertia switch and the crash load build up on the safety restraint system. In this 15 to 20 milliseconds interval the motor 42 is capable of retracting 5 to 10 centimeters of the slack before the crash loads are applied to the seat belt by the occupant (col. 3, line 66 to col. 4, line 12).

The present invention is characterized as follows:

- 1) The control means controls the motor so as to give a first predetermined amount of looseness to the seatbelt when the significant degree of danger is not detected by the danger degree detecting means while the seatbelt is detected to be in the state attached to the occupant, and controls the motor so as to give a second predetermined amount of looseness to the seatbelt which is smaller than the first predetermined amount of looseness when the significant degree of danger is detected by the danger degree

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detecting means while the seatbelt is detected to be in the state attached to the occupant; and

2) The danger degree detecting means comprises at least one of vehicle speed detecting means for detecting traveling speed of the automotive vehicle, braking detecting means for detecting stepping-on of a brake pedal of the automotive vehicle, steering angle change rate detecting means for detecting a rate of change in a steering angle of the automotive vehicle, ambient illuminance detecting means for detecting ambient illuminance of the automotive vehicle, and raindrop detecting means for detecting raindrops on the automotive vehicle.

According to the present invention, when no significant degree of danger is detected, the first amount of looseness is given to the seatbelt, whereby the occupant does not have a feeling of oppression, and on the other hand, when the significant degree of danger is detected, the second amount of looseness is given to the seatbelt, whereby the occupant can be properly protected. As a result, a comfortable seatbelt attaching feeling can be given to the occupant, while the occupant can be properly protected.

Further, the danger degree detecting means comprises at least one of the vehicle speed detecting means, the braking detecting means, the steering angle change rate detecting means,

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the ambient illuminance detecting means, and the raindrop detecting means, and therefore it is possible to properly protect the occupant in a manner dependent upon the degree of danger of collision of the automotive vehicle.

In Frantom et al., the crash sensor 32 may be an inertia activated switch or a simple radar system which anticipates a crash from a distance and/or rate of closure signals (col. 4, lines 2 - 5).

That is, the crash sensor 32 of Frantom et al. does not include at least one of vehicle speed detecting means for detecting traveling speed of the automotive vehicle, braking detecting means for detecting stepping-on of a brake pedal of the automotive vehicle, steering angle change rate detecting means for detecting a rate of change in a steering angle of the automotive vehicle, ambient illuminance detecting means for detecting ambient illuminance of the automotive vehicle, and/or raindrop detecting means for detecting raindrops on the automotive vehicle.

Thus, Frantom et al. do not disclose, teach or suggest, inter alia:

wherein said danger degree detecting means comprises at least one of vehicle speed detecting means for detecting traveling speed of the automotive vehicle, braking detecting means for detecting stepping-on of a brake pedal of the automotive vehicle, steering angle change rate detecting

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means for detecting a rate of change in a steering angle of the automotive vehicle, ambient illuminance detecting means for detecting ambient illuminance of the automotive vehicle, and raindrop detecting means for detecting raindrops on the automotive vehicle (see claim 2, lines 24-33).

None of the other references of record close the gap between the present claimed invention as defined by amended claim 2 and Frantom et al. Therefore, claim 2 is patentable over Frantom et al. and all of the other references of record when taken either alone under 35 USC 102 or in combination under 35 USC 103.

Claim 3 is patentable in view of its dependence on claim 2 and because the references do not disclose, teach or suggest each of the limitations now recited in claim 3.

Claim 4 has been written in independent form.

Claims 5-10 are patentable in view of their dependence on claim 2 and in view of the allowability of claims 5-10 indicated by the Examiner in the Office Action.

Claim 11 is amended to be in independent form to include limitations from claim 2.

Claims 12-17 are patentable in view of their dependence on claim 2 and in view of the allowability of claims 12-17 set forth by the Examiner in the last Office Action.

In view of the foregoing, claims 2-17 are in form for immediate allowance, which action is earnestly solicited.

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CLAIM FEE

It is respectfully submitted that no additional fees are due because the application after entry of this Amendment includes three (3) independent claims and sixteen (16) total claims. If, however, it is determined that additional fees are due, please charge our Deposit Account No. 06-1378 for such sum.

\* \* \* \* \*

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

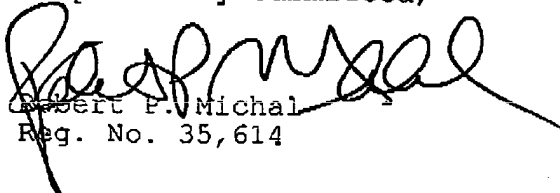
If the Examiner disagrees with any of the foregoing, the Examiner is respectfully requested to point out where there is support for a contrary view.



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If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

  
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